

CLAIMS

1. A method comprising:
communicating, in a first communication direction, with a base station using a link frequency within a first frequency bandwidth allocated for communication with a mobile station in a second communication direction.

2. A method in accordance with claim 1, further comprising:
communicating, in the first communication direction, with the mobile station using a coverage signal within a second frequency bandwidth allocated for communication with a mobile station in first communication direction.

3. A method in accordance with claim 2, wherein the communicating in the first communication direction with the base station comprises:
exchanging a link signal corresponding to a coverage signal exchanged with the mobile station.

4. A method in accordance with claim 3, further comprising:
communicating, in the second communication direction, with the base station using a second link frequency within the second frequency bandwidth allocated for communication with a mobile station in the first communication direction.

5. A method in accordance with claim 4, wherein the communicating, in the second communication direction, with the base station comprises:
exchanging a second link signal corresponding to a second coverage signal exchanged with the mobile station in the second communication direction.

6. A method in accordance with claim 5, wherein:
the first communication direction is upstream,
the second communication direction is downstream,
the link frequency is an upstream link frequency;
the first frequency bandwidth is a downstream frequency bandwidth
allocated for downstream communication with the mobile station, and
the second frequency bandwidth is an upstream frequency bandwidth
allocated for upstream communication with the mobile station.

7. A method in accordance with claim 6, wherein the communicating in a
first communication direction comprises:

transmitting an upstream link signal at the upstream link frequency to
the base station, the upstream link signal corresponding to an upstream coverage
signal received from the mobile station within the upstream frequency bandwidth.

8. A method in accordance with claim 7, wherein the communicating in
the first communication direction with the mobile station comprises:

receiving the upstream coverage signal from the mobile station.

9. A method in accordance with claim 8, wherein the communicating in
the second communication direction with the base station comprises:

receiving a downstream link signal at a downstream link frequency
within the upstream frequency bandwidth, the downstream link signal corresponding
to a downstream coverage signal transmitted to the mobile station within the
downstream frequency bandwidth.

10. A method in accordance with claim 5, wherein:
the first communication direction is downstream,
the second communication direction is upstream,

the link frequency is a downstream link frequency;
the first frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station, and
the second frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station.

11. A method in accordance with claim 10, wherein the communicating in a first communication direction comprises:

receiving a downstream link signal at the downstream link frequency from the base station, the downstream link signal corresponding to a downstream coverage signal transmitted to the mobile station within the downstream frequency bandwidth.

12. A method in accordance with claim 11, wherein the communicating in the first communication direction with the mobile station comprises:

transmitting the downstream coverage signal to the mobile station.

13. A method in accordance with claim 12, wherein the communicating in the second communication direction with the base station comprises:

transmitting an upstream link signal at an upstream link frequency within the downstream frequency bandwidth, the upstream link signal corresponding to an upstream coverage signal received from the mobile station within the upstream frequency bandwidth.

14. A method comprising:

receiving, from a mobile station, an upstream coverage signal at an upstream coverage frequency within an upstream frequency bandwidth allocated for upstream communication with the mobile station; and

transmitting, to a base station, an upstream link signal at an

upstream link frequency within a downstream frequency bandwidth allocated for downstream communication with the mobile station, the upstream link signal corresponding to the upstream coverage signal.

15. A method in accordance with claim 14, further comprising:
frequency shifting the upstream coverage signal to the upstream link frequency to form the upstream link signal.

16. A method in accordance with claim 15, further comprising:
receiving, from the base station, a downstream link signal at a downstream link frequency within the upstream frequency bandwidth; and
transmitting, to the mobile station, a downstream coverage signal at a downstream coverage frequency within the downstream frequency bandwidth.

17. A method in accordance with claim 16, further comprising:
frequency shifting the downstream link signal to the downstream coverage frequency to form the downstream coverage signal.

18. A method in accordance with claim 17, wherein the downstream coverage frequency and the upstream coverage frequency form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

19. A method comprising:
receiving, from a interface station communicatively connected to a cellular base station, a downstream link signal at a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication with a mobile station, the downstream link signal corresponding to a

downstream coverage signal transmitted from the cellular base station to the interface station,

frequency shifting the downstream link signal to a downstream coverage frequency to form the downstream coverage signal;

transmitting the downstream coverage signal to the mobile station;

receiving, from the mobile station, an upstream coverage signal at an upstream coverage frequency within the upstream frequency bandwidth;

frequency shifting the upstream coverage signal to an upstream link frequency within a downstream frequency bandwidth allocated to the cellular base station for downstream communication with the mobile station to form an upstream link signal; and

transmitting the upstream link signal to the interface station, the upstream link signal corresponding to an upstream coverage signal transmitted from interface station to the cellular base station.

20. A method in accordance with claim 19, wherein the downstream coverage frequency and the upstream coverage frequency are separated by a frequency difference and form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

21. A method in accordance with claim 20, wherein the upstream frequency bandwidth comprises a plurality of upstream coverage channels at upstream coverage frequencies and at least one downstream link channel.

22. A method in accordance with claim 20, wherein the downstream frequency bandwidth comprises a plurality of downstream coverage channels at the downstream coverage frequencies and at least one upstream link channel.

23. A method comprising:
communicating, in a first communication direction, with a distribution station using a link frequency within a first frequency bandwidth allocated for communication with a mobile station in a second communication direction.
24. A method in accordance with claim 23, further comprising:
communicating, in the first communication direction, with a cellular base station using a coverage signal within a second frequency bandwidth allocated for communication with the mobile station in first communication direction.
25. A method in accordance with claim 24, wherein the communicating in the first communication direction with the distribution station comprises:
exchanging a link signal corresponding to a coverage signal exchanged with the cellular base station.
26. A method in accordance with claim 25, further comprising:
communicating, in the second communication direction, with the distribution station using a second link frequency within the second frequency bandwidth allocated for communication with the mobile station in the first communication direction.
27. A method in accordance with claim 26, wherein the communicating, in the second communication direction, with the distribution station comprises:
exchanging a second link signal corresponding to a second coverage signal exchanged with the cellular base station in the second communication direction.
28. A method in accordance with claim 27, wherein:
the first communication direction is upstream,
the second communication direction is downstream,

the link frequency is an upstream link frequency;
the first frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station, and
the second frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station.

29. A method in accordance with claim 28, wherein the communicating in a first communication direction comprises:

receiving an upstream link signal at the upstream link frequency from the distribution station, the upstream link signal corresponding to an upstream coverage signal transmitted to the cellular base station within the upstream frequency bandwidth.

30. A method in accordance with claim 29, wherein the communicating in the first communication direction with the cellular base station comprises:

transmitting the upstream coverage signal to the cellular base station.

31. A method in accordance with claim 30, wherein the communicating in the second communication direction with the distribution station comprises:

transmitting a downstream link signal at a downstream link frequency within the upstream frequency bandwidth, the downstream link signal corresponding to a downstream coverage signal received from the cellular base station within the downstream frequency bandwidth.

32. A method in accordance with claim 27, wherein:

the first communication direction is downstream,
the second communication direction is upstream,
the link frequency is downstream link frequency;
the first frequency bandwidth is an upstream frequency bandwidth

allocated for upstream communication with the mobile station, and
the second frequency bandwidth is a downstream frequency
bandwidth allocated for downstream communication with the mobile station.

33. A method in accordance with claim 32, wherein the communicating in
a first communication direction comprises:

transmitting a downstream link signal at the downstream link
frequency to the distribution station, the downstream link signal corresponding to a
downstream coverage signal received from the cellular base station within the
downstream frequency bandwidth.

34. A method in accordance with claim 33, wherein the communicating in
the first communication direction with the cellular base station comprises:

receiving the downstream coverage signal from the cellular base
station.

35. A method in accordance with claim 34, wherein the communicating in
the second communication direction with the distribution station comprises:

receiving an upstream link signal at an upstream link frequency within
the downstream frequency bandwidth, the upstream link signal corresponding to an
upstream coverage signal transmitted to cellular base station within the upstream
frequency bandwidth.

36. A method in accordance with claim 23, wherein the distribution station
is configured to exchange a mobile coverage signal with the mobile station
corresponding to a cellular base station coverage signal exchanged with the cellular
base station.

37. A method comprising:

receiving, from a cellular base station, a downstream coverage signal at a downstream coverage frequency within a downstream frequency bandwidth allocated for downstream communication with the mobile station; and

transmitting, to a distribution station, a downstream link signal at an downstream link frequency within an upstream frequency bandwidth allocated for upstream communication with the mobile station, the downstream link signal corresponding to the downstream coverage signal.

38. A method in accordance with claim 37, further comprising:

frequency shifting the downstream coverage signal to the downstream link frequency to form the downstream link signal.

39. A method in accordance with claim 38, further comprising:

receiving, from the distribution station, an upstream link signal at an upstream link frequency within the downstream frequency bandwidth; and

transmitting, to the cellular base station, an upstream coverage signal at an upstream coverage frequency within the upstream frequency bandwidth.

40. A method in accordance with claim 39, further comprising:

frequency shifting the upstream link signal to the upstream coverage frequency to form the upstream coverage signal.

41. A method in accordance with claim 40, wherein the downstream coverage frequency and the upstream coverage frequency form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

42. A method comprising:

receiving, from a distribution station in wireless communication with a mobile station, an upstream link signal at a upstream link frequency within a downstream frequency bandwidth allocated to the cellular base station for downstream communication with the mobile station, the upstream link signal corresponding to an upstream coverage signal transmitted from the mobile station to the distribution station,

frequency shifting the upstream link signal to an upstream coverage frequency to form the upstream coverage signal;

transmitting the upstream coverage signal to the cellular base station;

receiving, from the cellular base station, a downstream coverage signal at an downstream coverage frequency within the downstream frequency bandwidth;

frequency shifting the downstream coverage signal to a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication with the mobile station to form a downstream link signal; and

transmitting the downstream link signal to the distribution station, the downstream link signal corresponding to a downstream coverage signal transmitted from the distribution station to the mobile station.

43. A method in accordance with claim 42, wherein the downstream coverage frequency and the upstream coverage frequency are separated by a frequency difference and form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

44. A method in accordance with claim 43, wherein the upstream frequency bandwidth comprises a plurality of upstream coverage channels at upstream coverage frequencies and at least one downstream link channel.

45. A method in accordance with claim 43, wherein the downstream frequency bandwidth comprises a plurality of downstream coverage channels at the downstream coverage frequencies and at least one upstream link channel.

46. A method comprising:

exchanging a link signal, in a first communication direction, between a base station and a distribution station using a link frequency within a first frequency bandwidth allocated for communication between the mobile station and the base station in a second communication direction; and

exchanging a coverage signal corresponding to the link signal, in the first communication direction, between the mobile station and the distribution station using a coverage frequency within a second frequency bandwidth allocated for communication between the mobile station and the base station in the first communication direction.

47. A method in accordance with claim 46, further comprising:

exchanging, in the second communication direction, another link signal between the base station and the distribution station using another link frequency within the second frequency bandwidth allocated for communication between the mobile station and the base station in the first communication direction; and

exchanging, in the second communication direction, another coverage signal corresponding to the another link signal between the mobile station and the distribution station.

48. A method in accordance with claim 47, wherein:

the first communication direction is upstream,

the second communication direction is downstream,

the link frequency is an upstream link frequency;

the first frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication between base station and the mobile station, and

the second frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication between the mobile station and the base station.

49. A method in accordance with claim 48, wherein the exchanging the link signal in a first communication direction comprises:

transmitting an upstream link signal at the upstream link frequency from the distribution station to the base station, the upstream link signal corresponding to an upstream coverage signal received from the mobile station within the upstream frequency bandwidth.

50. A method in accordance with claim 49, wherein the exchanging the coverage signal in the first communication direction comprises:

receiving the upstream coverage signal from the mobile station.

51. A method in accordance with claim 50, wherein the communicating in the second communication direction between the base station and the distribution station comprises:

transmitting a downstream link signal at a downstream link frequency within the upstream frequency bandwidth from the base station to the distribution station, the downstream link signal corresponding to a downstream coverage signal transmitted to the mobile station within the downstream frequency bandwidth.

52. A method in accordance with claim 48, wherein:

the first communication direction is downstream,
the second communication direction is upstream,

the link frequency is downstream link frequency;
the first frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station, and
the second frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station.

53. A method in accordance with claim 52, wherein the exchanging the link signal in a first communication direction comprises:

transmitting a downstream link signal at the downstream link frequency from the base station to the distribution station, the downstream link signal corresponding to a downstream coverage signal transmitted to the mobile station within the downstream frequency bandwidth.

54. A method in accordance with claim 53, wherein the exchanging the coverage signal in the first communication direction with the mobile station comprises:

transmitting the downstream coverage signal to the mobile station.

55. A method in accordance with claim 54, wherein the exchanging the link signal in the second communication direction with the base station comprises:

transmitting an upstream link signal at an upstream link frequency within the downstream frequency bandwidth from the distribution station to the base station, the upstream link signal corresponding to an upstream coverage signal received from the mobile station within the upstream frequency bandwidth.

56. A method comprising:

receiving, from a mobile station, an upstream coverage signal at an upstream coverage frequency within an upstream frequency bandwidth allocated for upstream communication with the mobile station; and

transmitting from a distribution station to an interface base station, an upstream link signal at an upstream link frequency within a downstream frequency bandwidth allocated for downstream communication with the mobile station, the upstream link signal corresponding to the upstream coverage signal; and

transmitting from the interface station to a cellular base station, the upstream coverage signal.

57. A method in accordance with claim 56, further comprising:

frequency shifting, at the distribution station, the upstream coverage signal to the upstream link frequency to form the upstream link signal; and

frequency shifting, at the interface station, the upstream link signal from the upstream link frequency to the upstream coverage frequency to form the upstream coverage signal.

58. A method in accordance with claim 57, further comprising:

receiving, at the interface station from the base station, a downstream coverage signal at a downstream coverage frequency within the downstream frequency bandwidth,

transmitting a downstream link signal at a downstream link frequency within the upstream frequency bandwidth to the distribution station; and

transmitting, to the mobile station, the downstream coverage signal at the downstream coverage frequency within the downstream frequency bandwidth.

59. A method in accordance with claim 58, further comprising:

frequency shifting, at the interface station, the downstream coverage signal to the downstream link frequency to form the downstream link signal; and

frequency shifting, at the distribution station, the downstream link signal to the downstream coverage frequency to form the downstream coverage signal.

60. A method in accordance with claim 59, wherein the downstream coverage frequency and the upstream coverage frequency form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

61. A method comprising:

receiving, at an interface station communicatively connected to a cellular base station, a downstream coverage signal at a downstream coverage frequency within a downstream frequency bandwidth allocated to the cellular base station for downstream communication with a mobile station;

frequency shifting, at the interface station, the downstream coverage signal to a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication between a mobile station and the cellular base station,

transmitting, from the interface station to a distribution station the downstream link signal;

frequency shifting, at the distribution station, the downstream link signal to the downstream coverage frequency to form the downstream coverage signal;

transmitting the downstream coverage signal to the mobile station;

receiving at the distribution station from the mobile station, an upstream coverage signal at an upstream coverage frequency within the upstream frequency bandwidth;

frequency shifting, at the distribution station, the upstream coverage signal to an upstream link frequency within a downstream frequency bandwidth

allocated to the cellular base station for downstream communication between the cellular base station and the mobile station to form an upstream link signal;

transmitting the upstream link signal from the distribution station to the interface station;

frequency shifting, at the interface station, the upstream link frequency to the upstream coverage frequency to form the upstream coverage signal; and

transmitting the upstream coverage frequency from the interface station to the cellular base station.

62. A method in accordance with claim 61, wherein the downstream coverage frequency and the upstream coverage frequency are separated by a frequency difference and form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

63. A method in accordance with claim 62, wherein the upstream frequency bandwidth comprises a plurality of upstream coverage channels at upstream coverage frequencies and at least one downstream link channel.

64. A method in accordance with claim 62, wherein the downstream frequency bandwidth comprises a plurality of downstream coverage channels at the downstream coverage frequencies and at least one upstream link channel.

65. An apparatus comprising:

a link communication interface configured to communicate, in a first communication direction, with a base station using a link frequency within a first frequency bandwidth allocated for communication with a mobile station in a second communication direction; and

a coverage communication interface configured to communicate with a mobile station in the first communication direction using a coverage frequency within a second frequency bandwidth allocated for communication with a mobile station in first communication direction.

66. An apparatus in accordance with claim 65, wherein:

the link communication interface is further configured to exchange a link signal at the link frequency with the base station; and
the coverage communication interface is further configured to exchange a coverage signal corresponding to the link signal, at the coverage frequency, with the mobile station.

67. An apparatus in accordance with claim 65, wherein the link communication interface is further configured to communicate, in the second communication direction, with the base station using a second link frequency within the second frequency bandwidth allocated for communication with the mobile station in the first communication direction.

68. An apparatus in accordance with claim 65, wherein:

the link communication interface is further configured to communicate, in the second communication direction, with the base station by exchanging a second link signal; and
the coverage communication interface is further configured to exchange a second coverage signal with the mobile station, the second coverage signal corresponding to the second link signal.

69. A apparatus in accordance with claim 68, wherein:

the first communication direction is upstream,
the second communication direction is downstream,

the link frequency is an upstream link frequency;
the first frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station, and
the second frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station.

70. An apparatus in accordance with claim 69, wherein:
the link interface comprises a transmitter configured to transmit an upstream link signal at the upstream link frequency to the base station, and
the coverage interface comprises a receiver configured to receive an upstream coverage signal from the mobile station within the upstream frequency bandwidth, the upstream link signal corresponding to the upstream coverage signal.
71. An apparatus in accordance with claim 70, further comprising:
an upstream frequency shifter configured to frequency shift the upstream coverage signal to the upstream link signal to form the upstream link signal.
72. An apparatus in accordance with claim 71, wherein:
the link interface comprises a receiver configured to receive a downstream link signal at the downstream link frequency from the base station, and
the coverage interface comprises a transmitter configured to transmit a downstream coverage signal to the mobile station within the downstream frequency bandwidth, the downstream coverage signal corresponding to the downstream link signal.

73. An apparatus in accordance with claim 72, further comprising:
a downstream frequency shifter configured to frequency shift the downstream link signal to the downstream coverage frequency to form the downstream coverage signal.
74. An apparatus in accordance with claim 68, wherein:
the first communication direction is downstream,
the second communication direction is upstream,
the link frequency is downstream link frequency;
the first frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station, and
the second frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station.
75. An apparatus in accordance with claim 74, wherein:
the link interface comprises a receiver configured to receive a downstream stream link signal at the downstream link frequency from the base station, and
the coverage interface comprises a transmitter configured to transmit a downstream coverage signal to the mobile station within the downstream frequency bandwidth, the downstream link signal corresponding to the downstream coverage signal.
76. An apparatus in accordance with claim 75, further comprising:
a downstream frequency shifter configured to frequency shift the downstream link signal to the downstream coverage frequency to form the downstream coverage signal.

77. An apparatus in accordance with claim 71, wherein:
the link interface further comprises a transmitter configured to transmit
an upstream link signal at the upstream link frequency to the base station, and
the coverage interface comprises a receiver configured to receive an
upstream coverage signal from the mobile station within the upstream
frequency bandwidth, the upstream coverage signal corresponding to the
upstream link signal.
78. An apparatus in accordance with claim 77, further comprising:
an upstream frequency shifter configured to frequency shift the
upstream coverage signal to the upstream link signal to form the upstream link signal.
79. An apparatus comprising:
a coverage receiver configured to receive, from a mobile station, an
upstream coverage signal at an upstream coverage frequency within an upstream
frequency bandwidth allocated for upstream communication with the mobile station;
and
a link transmitter configured to transmit, to a base station, an
upstream link signal at an upstream link frequency within a downstream
frequency bandwidth allocated for downstream communication with the mobile
station, the upstream link signal corresponding to the upstream coverage signal.
80. An apparatus in accordance with claim 79, further comprising:
an upstream frequency shifter configured to frequency shift the
upstream coverage signal to the upstream link frequency to form the upstream
link signal.

81. An apparatus in accordance with claim 80, further comprising:
a link receiver configured to receive, from the base station, a downstream link signal at a downstream link frequency within the upstream frequency bandwidth; and
a coverage transmitter configured to transmit, to the mobile station, a downstream coverage signal at a downstream coverage frequency within the downstream frequency bandwidth.
82. An apparatus in accordance with claim 81, further comprising:
a downstream frequency shifter configured to frequency shift the downstream link signal to the downstream coverage frequency to form the downstream coverage signal.
83. An apparatus in accordance with claim 82, wherein the downstream coverage frequency and the upstream coverage frequency form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.
84. A distribution station comprising:
a link receiver configured to receive, from a interface station communicatively connected to a cellular base station, a downstream link signal at a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication with a mobile station, the downstream link signal corresponding to a downstream coverage signal transmitted from the cellular base station to the interface station,
a downstream frequency shifter configured to frequency shift the downstream link signal to a downstream coverage frequency to form the downstream coverage signal;

a coverage transmitter configured to transmit the downstream coverage signal to the mobile station;

a coverage receiver configured to receive, from the mobile station, an upstream coverage signal at an upstream coverage frequency within the upstream frequency bandwidth;

an upstream frequency shifter configured to frequency shift the upstream coverage signal to an upstream link frequency within a downstream frequency bandwidth allocated to the cellular base station for downstream communication with the mobile station to form an upstream link signal; and

a link transmitter configured to transmit the upstream link signal to the interface station, the upstream link signal corresponding to an upstream coverage signal transmitted from interface station to the cellular base station.

85. An apparatus in accordance with claim 84, wherein the downstream coverage frequency and the upstream coverage frequency are separated by a frequency difference and form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

86. An apparatus in accordance with claim 85, wherein the upstream frequency bandwidth comprises a plurality of upstream coverage channels at upstream coverage frequencies and at least one downstream link channel.

87. An apparatus in accordance with claim 85, wherein the downstream frequency bandwidth comprises a plurality of downstream coverage channels at the downstream coverage frequencies and at least one upstream link channel.

88. An apparatus comprising:

a link communication interface configured to communicate, in a first communication direction, with a distribution station using a link frequency within a first frequency bandwidth allocated for communication with a mobile station in a second communication direction; and

a coverage communication interface configured to communicate with a cellular base station in the first communication direction using a coverage frequency within a second frequency bandwidth allocated for communication with a mobile station in the first communication direction.

89. An apparatus in accordance with claim 88, wherein:

the link communication interface is further configured to exchange a link signal at the link frequency with the distribution station; and

the coverage communication interface is further configured to exchange a coverage signal corresponding to the link signal, at the coverage frequency, with the cellular base station.

90. An apparatus in accordance with claim 88, wherein the link communication interface is further configured to communicate, in the second communication direction, with the distribution station using a second link frequency within the second frequency bandwidth allocated for communication with the mobile station in the first communication direction.

91. An apparatus in accordance with claim 88, wherein:

the link communication interface is further configured to communicate, in the second communication direction, with the distribution station by exchanging a second link signal; and

the coverage communication interface is further configured to exchange a second coverage signal with the cellular base station, the second coverage signal corresponding to the second link signal.

92. A apparatus in accordance with claim 91, wherein:
the first communication direction is upstream,
the second communication direction is downstream,
the link frequency is an upstream link frequency;
the first frequency bandwidth is a downstream frequency bandwidth
allocated for downstream communication with the mobile station, and
the second frequency bandwidth is an upstream frequency bandwidth
allocated for upstream communication with the mobile station.

93. An apparatus in accordance with claim 92, wherein:
the link interface comprises a receiver configured to receive an
upstream link signal at the upstream link frequency from the distribution
station, and
the coverage interface comprises a transmitter configured to transmit
an upstream coverage signal to the cellular base station within the upstream
frequency bandwidth, the upstream coverage signal corresponding to the
upstream link signal.

94. An apparatus in accordance with claim 93, further comprising:
an upstream frequency shifter configured to frequency shift the
upstream link signal to the upstream coverage signal to form the upstream coverage
signal.

95. An apparatus in accordance with claim 94, wherein:
the link interface comprises a link transmitter configured to transmit a
downstream link signal at the downstream link frequency to the distribution
station, and

the coverage interface comprises a coverage receiver configured to receive a downstream coverage signal from the cellular base station within the downstream frequency bandwidth, the downstream link signal corresponding to the downstream coverage signal.

96. An apparatus in accordance with claim 94, further comprising:
a downstream frequency shifter configured to frequency shift the downstream coverage signal to the downstream link frequency to form the downstream link signal.

97. An apparatus in accordance with claim 91, wherein:
the first communication direction is downstream,
the second communication direction is upstream,
the link frequency is downstream link frequency;
the first frequency bandwidth is an upstream frequency bandwidth allocated for upstream communication with the mobile station, and
the second frequency bandwidth is a downstream frequency bandwidth allocated for downstream communication with the mobile station.

98. An apparatus in accordance with claim 97, wherein:
the link interface comprises a link transmitter configured to transmit a downstream link signal at the downstream link frequency to the distribution station, and
the coverage interface comprises a coverage receiver configured to receive a downstream coverage signal from the cellular base station within the downstream frequency bandwidth, the downstream link signal corresponding to the downstream coverage signal.

99. An apparatus in accordance with claim 98, further comprising:
a downstream frequency shifter configured to frequency shift the downstream coverage signal to the downstream link frequency to form the downstream link signal.

100. An apparatus in accordance with claim 97, wherein:
the link interface further comprises a link receiver configured to receive an upstream link signal at the upstream link frequency from the distribution station, and
the coverage interface comprises a coverage transmitter configured to transmit an upstream coverage signal to the cellular base station within the upstream frequency bandwidth, the upstream coverage signal corresponding to the upstream link signal.

101. An apparatus in accordance with claim 92, further comprising:
an upstream frequency shifter configured to frequency shift the upstream link signal to the upstream coverage signal to form the upstream coverage signal.

102. An apparatus comprising:
a link receiver configured to receive, from a distribution station, an upstream link signal at an upstream link frequency within a downstream frequency bandwidth allocated for downstream communication with a mobile station; and
a coverage transmitter configured to transmit, to a cellular base station, an upstream coverage signal at an upstream coverage frequency within an upstream frequency bandwidth allocated for upstream communication with the mobile station, the upstream link signal corresponding to the upstream coverage signal.

103. An apparatus in accordance with claim 102, further comprising:

an upstream frequency shifter configured to frequency shift the upstream link signal to the upstream coverage frequency to form the upstream coverage signal.

104. An apparatus in accordance with claim 103, further comprising:
- a link transmitter configured to transmit, to the distribution station, a downstream link signal at a downstream link frequency within the upstream frequency bandwidth; and
 - a coverage receiver configured to transmit, to the cellular base station, a downstream coverage signal at a downstream coverage frequency within the downstream frequency bandwidth.

105. An apparatus in accordance with claim 104, further comprising:
- a downstream frequency shifter configured to frequency shift the downstream coverage signal to the downstream link frequency to form the downstream link signal.

106. An apparatus in accordance with claim 105, wherein the downstream coverage frequency and the upstream coverage frequency form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

107. An interface station configured to communicatively connect to a cellular base station, the interface station comprising:
- a link transmitter configured to transmit, to a distribution station communicatively connected to a mobile station, a downstream link signal at a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication with the mobile station, the

downstream link signal corresponding to a downstream coverage signal transmitted from the cellular base station to the interface station;

a downstream frequency shifter configured to frequency shift the downstream coverage signal to a downstream link frequency to form the downstream link signal;

a coverage receiver configured to receive the downstream coverage signal from the cellular base station;

a link receiver configured to receive an upstream link signal from the distribution station;

an upstream frequency shifter configured to frequency shift the upstream link signal to an upstream coverage frequency within a downstream frequency bandwidth allocated to the cellular base station for downstream communication with the mobile station to form an upstream coverage signal; and

a coverage transmitter configured to transmit, to the cellular base station, the upstream coverage signal at the upstream coverage frequency within the upstream frequency bandwidth.

108. An apparatus in accordance with claim 107, wherein the downstream coverage frequency and the upstream coverage frequency are separated by a frequency difference and form one frequency pair of a plurality of frequency pairs, each frequency pair having an upstream frequency and a downstream frequency separated by the frequency difference.

109. An apparatus in accordance with claim 108, wherein the upstream frequency bandwidth comprises a plurality of upstream coverage channels at upstream coverage frequencies and at least one downstream link channel.

110. An apparatus in accordance with claim 108, wherein the downstream frequency bandwidth comprises a plurality of downstream coverage channels at the downstream coverage frequencies and at least one upstream link channel.

111. A base station comprising:

a link communication interface configured to communicate, in a first communication direction, with a distribution station using a link frequency within a first frequency bandwidth allocated for communication with a mobile station in a second communication direction.

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112. A base station comprising:

a link transmitter configured to transmit, to a distribution station communicatively connected to a mobile station, a downstream link signal at a downstream link frequency within an upstream frequency bandwidth allocated to the cellular base station for upstream communication with the mobile station, the downstream link signal corresponding to a downstream coverage signal transmitted from the distribution station to the mobile station.

113. A base station in accordance with claim 1, further comprising:

a link receiver configured to receive, from the distribution station, an upstream link signal at an upstream link frequency within a downstream frequency bandwidth allocated for downstream communication with the mobile station, the downstream link signal corresponding to a downstream coverage signal transmitted from the distribution station to the mobile unit within the downstream frequency bandwidth.